#6

SEQUENCE LISTING

<110> Ditzel, H.
Burton, D.
Schaller, M.

<120> Autoantibodies to glucose-6-phosphate isomerase and their participation in autoimmune disease

<130> 1361.005US1

<140> US 09/828,708
<141> 2001-04-06

<160> 123

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 109
<212> PRT
<213> Homo sapiens

6A

<400> 1

Pro	Asp	Ser	Leu	Ala	Val	Ser	Leu	Gly	Glu	Arg	Ala	Thr	Ile	Asn	Cys
1				5					10					15	
Lys	Ser	Ser	Gln	Ser	Val	Phe	Tyr	Thr	Ser	Asn	Asn	Lys	Asn	Tyr	Leu
		20					25					30			
Ala	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Gln	Pro	Pro	Lys	Leu	Leu	Ile	Tyr
	35					40					45				
Trp	Ala	Ser	Thr	Arg	Glu	Ser	Gly	Val	Pro	Asp	Arg	Phe	Ser	Gly	Ser
50					55					60					
Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr	Ile	Ser	Ser	Leu	Gln	Ala	Glu
65				70					75					80	
Asp	Val	Ala	Val	Tyr	Tyr	Cys	Gln	Gln	Tyr	Tyr	Asp	Ser	Tyr	Thr	Phe
			85					90					95		
Gly	Gln	Gly	Thr	Lys	Leu	Glu	Ile	Lys	Arg	Thr	Val	Ala			
		100					105								

<210> 2
<211> 104
<212> PRT
<213> Homo sapiens

<400> 2

Pro	Ser	Phe	Leu	Ser	Ala	Ser	Val	Gly	Asp	Arg	Val	Thr	Ile	Thr	Cys
1				5					10					15	
Arg	Ala	Ser	Gln	Gly	Ile	Ser	Ser	Tyr	Leu	Ala	Trp	Tyr	Gln	Leu	Lys
		20					25					30			
Pro	Gly	Lys	Ala	Pro	Lys	Leu	Leu	Ile	Tyr	Ala	Ala	Ser	Thr	Leu	Gln
	35					40					45				
Ser	Gly	Val	Pro	Ser	Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Glu	Phe
50					55					60					
Thr	Leu	Thr	Ile	Ser	Ser	Leu	Gln	Pro	Glu	Asp	Phe	Ala	Thr	Tyr	Tyr
65				70					75					80	
Cys	Gln	Gln	Leu	Asn	Ser	Tyr	Pro	Leu	Thr	Phe	Gly	Gly	Gly	Ala	Lys
			85					90					95		
Val	Gly	Ile	Arg	Arg	Thr	Val	Ala								
		100													

<210> 3
<211> 105
<212> PRT
<213> Homo sapiens

<400> 3
Pro Gly Thr Leu Ser Leu Ser Pro Gly Glu Arg Ala Thr Leu Ser Cys
 1   5   10   15
Arg Ala Ser Gln Ser Val Ser Ser Ser Tyr Leu Ala Trp Tyr Gln Gln
            20   25   30
Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile Tyr Gly Ala Ser Ser Arg
        35   40   45
Ala Thr Gly Ile Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp
    50   55   60
Phe Thr Leu Thr Ile Ser Arg Leu Glu Pro Glu Asp Phe Ala Val Tyr
65   70   75   80
Tyr Cys Gln Gln Tyr Gly Ser Ser Pro Arg Thr Phe Gly Gln Gly Thr
                85   90   95
Lys Val Glu Ile Lys Arg Thr Val Ala
            100   105

<210> 4
<211> 109
<212> PRT
<213> Homo sapiens

<400> 4
Pro Asp Ser Leu Ala Val Ser Leu Gly Glu Arg Ala Thr Ile Asn Cys
 1   5   10   15
Lys Ser Ser Gln Ser Val Phe Tyr Thr Ser Asn Asn Lys Asn Tyr Leu
            20   25   30
Ala Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro Lys Leu Leu Ile Tyr
        35   40   45
Trp Ala Ser Thr Arg Glu Ser Gly Val Pro Asp Arg Phe Ser Gly Ser
    50   55   60
Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Ala Glu
65   70   75   80
Asp Val Ala Val Tyr Tyr Cys Gln Gln Tyr Tyr Asp Ser Tyr Thr Phe
                85   90   95
Gly Gln Gly Thr Lys Leu Glu Ile Lys Arg Thr Val Ala
            100   105

<210> 5
<211> 105
<212> PRT
<213> Homo sapiens

<400> 5
Pro Gly Thr Leu Ser Leu Ser Pro Gly Glu Gly Ala Thr Leu Ser Cys
 1   5   10   15
Arg Ala Ser Gln Ser Val Ser Ser Ser Tyr Leu Ala Trp Tyr Gln Gln
            20   25   30
Arg Pro Gly Gln Ala Pro Arg Leu Leu Ile Tyr Gly Ala Ser Ser Arg
        35   40   45
Ala Thr Gly Ile Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp
    50   55   60
Phe Ser Phe Thr Ile Ser Ser Leu Gln Pro Glu Asp Thr Gly Thr Tyr

65 70 75 80
Tyr Cys Gln Gln Tyr Asp Asn Val Pro Asp Thr Phe Gly Gln Gly Thr
85 90 95
Arg Leu Glu Ile Lys Arg Thr Val Ala
100 105

<210> 6
<211> 104
<212> PRT
<213> Homo sapiens

<400> 6
Pro Gly Thr Leu Ser Leu Ser Pro Gly Glu Gly Ala Thr Leu Ser Cys
1 5 10 15
Arg Ala Ser Gln Ser Val Ser Ser Ser Tyr Leu Ala Trp Tyr Gln Gln
20 25 30
Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile Tyr Gly Ala Ser Ser Arg
35 40 45
Ala Thr Gly Ile Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp
50 55 60
Phe Thr Leu Thr Ile Ser Arg Leu Glu Pro Glu Asp Phe Ala Val Tyr
65 70 75 80
Tyr Cys Gln Gln Tyr Gly Thr Ser Pro Leu Phe Gly Gln Gly Thr Arg
85 90 95
Leu Glu Ile Lys Arg Thr Val Ala
100

<210> 7
<211> 105
<212> PRT
<213> Homo sapiens

<400> 7
Pro Gly Thr Leu Ser Leu Ser Pro Gly Glu Arg Val Thr Leu Ser Cys
1 5 10 15
Arg Ala Ser Gln Ser Val Ser Ser Ser Tyr Leu Ala Trp Tyr Gln Gln
20 25 30
Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile Tyr Gly Ala Ser Ser Arg
35 40 45
Ala Thr Gly Ile Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp
50 55 60
Phe Thr Leu Thr Ile Ser Arg Leu Glu Pro Glu Asp Phe Ala Val Tyr
65 70 75 80
Tyr Cys Gln Gln Tyr Gly Ser Ser Pro Arg Thr Phe Gly Gln Gly Thr
85 90 95
Lys Val Glu Ile Lys Arg Thr Val Ala
100 105

<210> 8
<211> 112
<212> PRT
<213> Homo sapiens

<400> 8
Gly Gly Gly Val Val Gln Pro Gly Arg Ser Leu Lys Leu Ser Cys Ala
1 5 10 15
Ala Ser Gly Phe Thr Phe Ser Ser His Gly Ser His Trp Val Arg Gln
20 25 30

```
Ala Pro Gly Lys Gly Leu Glu Trp Val Ala Leu Leu Ser Ser Asp Gly
        35                  40                  45
Ser Asn Lys Phe Tyr Ile Glu Ser Val Lys Gly Arg Phe Thr Ile Ser
    50                  55                  60
Lys Asp Asn Ser Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg
65                  70                  75                  80
Ile Asp Asp Thr Ala Val Tyr Tyr Cys Ala Ile Ser Leu Val Gly Thr
                85                  90                  95
Thr Ala Phe Asn Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
            100                 105                 110

<210> 9
<211> 100
<212> PRT
<213> Homo sapiens

<400> 9
Gly Gly Gly Val Val Gln Ala Trp Arg Ser Leu Arg Leu Ser Cys Val
 1               5                  10                  15
Ala Ser Gly Phe Thr Phe Ser Ser His Thr Met His Trp Val Arg Gln
            20                  25                  30
Ala Pro Gly Lys Gly Leu Glu Trp Val Ala Leu Leu Thr Met Asp Arg
        35                  40                  45
Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu Gln Leu
    50                  55                  60
Ser Ser Leu Arg Pro Glu Asp Thr Ala Val Tyr Tyr Cys Thr Asn Ser
65                  70                  75                  80
Glu Val Gly Ala Thr Ala Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
                85                  90                  95
Thr Val Ser Ser
            100

<210> 10
<211> 101
<212> PRT
<213> Homo sapiens

<400> 10
Gly Gly Gly Val Val Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala
 1               5                  10                  15
Ala Ser Gly Phe Thr Phe Ser Ser Tyr Thr Phe His Trp Val Arg Gln
            20                  25                  30
Ala Pro Gly Lys Gly Leu Glu Trp Val Ala Val Ile Ser Tyr Asp Gly
        35                  40                  45
Asn Lys Lys Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser
    50                  55                  60
Lys Asp Asn Ser Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg
65                  70                  75                  80
Val Glu Asp Thr Ala Val Tyr Tyr Cys Ala Ile Ser Ile Val Gly Thr
                85                  90                  95
Thr Ala Phe Asn Tyr
            100

<210> 11
<211> 114
<212> PRT
<213> Homo sapiens
```

<400> 11
Gly Ala Glu Val Arg Lys Pro Gly Thr Ser Val Arg Ile Ser Cys Arg
 1   5   10   15
Ala Ser Gly Asn Thr Phe Thr Gly His His Ile His Trp Val Arg Gln
            20   25   30
Ala Pro Gly Gln Gly Leu Gln Trp Met Gly Arg Ile Asn Pro Thr Gly
        35   40   45
Gly Gly Val Ser Leu Ala Gln Ser Phe Gln Asp Arg Val Ser Leu Thr
    50   55   60
Arg Asp Arg Ser Ser Asn Thr Val Phe Leu Glu Leu Ser Gly Leu Thr
65   70   75   80
Glu Glu Asp Thr Ala Leu Tyr Phe Cys Ala Arg Pro Arg Phe Asn Met
                85   90   95
Ile Arg Glu Pro Leu Asp Leu Trp Gly Gln Gly Thr Val Val Thr Val
            100   105   110
Ser Ser

<210> 12
<211> 116
<212> PRT
<213> Homo sapiens

<400> 12
Gly Gly Gly Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala
 1   5   10   15
Thr Ser Gly Phe Ile Phe Asn Ser Tyr Ala Met Asn Trp Val Arg Gln
            20   25   30
Ala Pro Gly Lys Gly Leu Glu Trp Val Ser Arg Ile Ser Gly Asn Ser
        35   40   45
Gly Ser Thr Phe Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser
    50   55   60
Arg Asp Asn Ser Lys Asn Thr Ala Phe Leu Arg Met Asn Ser Gln Arg
65   70   75   80
Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala Lys Asp Leu Ser Ser Gly
                85   90   95
Ala Tyr Tyr Tyr Tyr Gly Met Asp Val Trp Gly Gln Gly Thr Thr Val
            100   105   110
Thr Val Ser Ser
        115

<210> 13
<211> 114
<212> PRT
<213> Homo sapiens

<400> 13
Gly Pro Gly Leu Val Arg Pro Ser Gln Thr Leu Ser Leu Thr Cys Pro
 1   5   10   15
Val Ser Pro Gly Ser Ile Lys Gly Asp Ser Tyr Phe Trp Ser Trp Val
            20   25   30
Arg Gln Pro Val Gly Lys Gly Leu Glu Trp Ile Gly Arg Ile Tyr Gly
        35   40   45
Arg Gly Thr Thr Asn Tyr Asn Arg Val Phe Gly Ser Arg Val Ser Met
    50   55   60
Ser Val Asp Met Ser Arg Ser Gln Phe Phe Leu Glu Leu Arg Asp Val
65   70   75   80
Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala Arg Asp Lys Gly Ser

```
                85                  90                  95
Glu Tyr Ser Tyr Phe Asp Pro Trp Gly Gln Gly Ile Val Val Asn Val
            100                 105                 110
Phe Ser


<210> 14
<211> 125
<212> PRT
<213> Homo sapiens

<400> 14
Gly Ala Glu Val Lys Lys Pro Gly Ser Ser Val Lys Val Ser Cys Arg
 1               5                  10                  15
Ala Ser Gly Gly Thr Phe Ser Arg Tyr Ala Ile Ser Trp Val Arg Gln
            20                  25                  30
Ala Pro Gly Gln Gly Leu Glu Trp Met Gly Gly Ile Ile Pro Pro Phe
        35                  40                  45
Gly Pro Val Asn Tyr Ala Gln Lys Phe Gln Gly Arg Val Thr Ile Thr
    50                  55                  60
Ala Asp Asp Ser Thr Asn Thr Ala Tyr Met Gly Leu Ser Ser Leu Arg
65                  70                  75                  80
Ser Gly Asp Thr Ala Val Tyr Tyr Cys Ala Arg Val Ala Tyr Asp Gly
                85                  90                  95
Ser Gly Tyr Tyr Asn Asn Ile Pro Lys Ile Tyr Tyr Tyr Ser Tyr Met
            100                 105                 110
Asp Val Trp Gly Lys Gly Thr Thr Val Thr Val Ser Ser
        115                 120                 125

<210> 15
<211> 5
<212> PRT
<213> Homo sapiens

<400> 15
Ser His Gly Ser His
 1               5

<210> 16
<211> 5
<212> PRT
<213> Homo sapiens

<400> 16
Ser His Thr Met His
 1               5

<210> 17
<211> 5
<212> PRT
<213> Homo sapiens

<400> 17
Ser Tyr Thr Phe His
 1               5

<210> 18
<211> 5
```

<212> PRT
<213> Homo sapiens

<400> 18
Gly His His Ile His
 1   5

<210> 19
<211> 5
<212> PRT
<213> Homo sapiens

<400> 19
Ser Tyr Ala Met Asn
 1   5

<210> 20
<211> 7
<212> PRT
<213> Homo sapiens

<400> 20
Gly Asp Ser Tyr Phe Trp Ser
 1   5

<210> 21
<211> 5
<212> PRT
<213> Homo sapiens

<400> 21
Arg Tyr Ala Ile Ser
 1   5

<210> 22
<211> 17
<212> PRT
<213> Homo sapiens

<400> 22
Leu Leu Ser Ser Asp Gly Ser Asn Lys Phe Tyr Ile Glu Ser Val Lys
 1   5   10   15
Gly

<210> 23
<211> 17
<212> PRT
<213> Homo sapiens

<400> 23
Leu Ile Phe Tyr Asp Gly Ser Asn Lys Tyr Tyr Ala Asp Ser Val Lys
 1   5   10   15
Gly

<210> 24
<211> 17

<212> PRT
<213> Homo sapiens

<400> 24
Val Ile Ser Tyr Asp Gly Asn Lys Lys Tyr Tyr Ala Asp Ser Val Lys
1 5 10 15
Gly

<210> 25
<211> 17
<212> PRT
<213> Homo sapiens

<400> 25
Arg Ile Asn Pro Thr Gly Gly Gly Val Ser Leu Ala Gln Ser Phe Gln
1 5 10 15
Asp

<210> 26
<211> 17
<212> PRT
<213> Homo sapiens

<400> 26
Arg Ile Ser Gly Asn Ser Gly Ser Thr Phe Tyr Ala Asp Ser Val Lys
1 5 10 15
Gly

<210> 27
<211> 16
<212> PRT
<213> Homo sapiens

<400> 27
Arg Ile Tyr Gly Arg Gly Thr Thr Asn Tyr Asn Arg Val Phe Gly Ser
1 5 10 15

<210> 28
<211> 17
<212> PRT
<213> Homo sapiens

<400> 28
Gly Ile Ile Pro Pro Phe Gly Pro Val Asn Tyr Ala Gln Lys Phe Gln
1 5 10 15
Gly

<210> 29
<211> 10
<212> PRT
<213> Homo sapiens

<400> 29
Ser Leu Val Gly Thr Thr Ala Phe Asn Tyr

1 5 10

<210> 30
<211> 10
<212> PRT
<213> Homo sapiens

<400> 30
Ser Glu Val Gly Ala Thr Ala Phe Asp Tyr
1 5 10

<210> 31
<211> 10
<212> PRT
<213> Homo sapiens

<400> 31
Ser Ile Val Gly Thr Thr Ala Phe Asn Tyr
1 5 10

<210> 32
<211> 12
<212> PRT
<213> Homo sapiens

<400> 32
Pro Arg Phe Asn Met Ile Arg Glu Pro Leu Asp Leu
1 5 10

<210> 33
<211> 14
<212> PRT
<213> Homo sapiens

<400> 33
Asp Leu Ser Ser Gly Ala Tyr Tyr Tyr Tyr Gly Met Asp Val
1 5 10

<210> 34
<211> 11
<212> PRT
<213> Homo sapiens

<400> 34
Asp Lys Gly Ser Glu Tyr Ser Tyr Phe Asp Pro
1 5 10

<210> 35
<211> 23
<212> PRT
<213> Homo sapiens

<400> 35
Val Ala Tyr Asp Gly Ser Gly Tyr Tyr Asn Asn Ile Pro Lys Ile Tyr
1 5 10 15
Tyr Tyr Ser Tyr Met Asp Val
20

<210> 36
<211> 17
<212> PRT
<213> Homo sapiens

<400> 36
Lys Ser Ser Gln Ser Val Phe Tyr Thr Ser Asn Asn Lys Asn Tyr Leu
 1   5   10   15
Ala

<210> 37
<211> 11
<212> PRT
<213> Homo sapiens

<400> 37
Arg Ala Ser Gln Gly Ile Ser Ser Tyr Leu Ala
 1   5   10

<210> 38
<211> 12
<212> PRT
<213> Homo sapiens

<400> 38
Arg Ala Ser Gln Ser Val Ser Ser Ser Tyr Leu Ala
 1   5   10

<210> 39
<211> 17
<212> PRT
<213> Homo sapiens

<400> 39
Lys Ser Ser Gln Ser Val Phe Tyr Thr Ser Asn Asn Lys Asn Tyr Leu
 1   5   10   15
Ala

<210> 40
<211> 12
<212> PRT
<213> Homo sapiens

<400> 40
Arg Ala Ser Gln Ser Val Ser Ser Ser Tyr Leu Ala
 1   5   10

<210> 41
<211> 12
<212> PRT
<213> Homo sapiens

<400> 41
Arg Ala Ser Gln Ser Val Ser Ser Ser Tyr Leu Ala
 1   5   10

<210> 42
<211> 12
<212> PRT
<213> Homo sapiens

<400> 42
Arg Ala Ser Gln Ser Val Ser Ser Ser Tyr Leu Ala
 1   5   10

<210> 43
<211> 7
<212> PRT
<213> Homo sapiens

<400> 43
Trp Ala Ser Thr Arg Glu Ser
 1   5

<210> 44
<211> 7
<212> PRT
<213> Homo sapiens

<400> 44
Ala Ala Ser Thr Leu Gln Ser
 1   5

<210> 45
<211> 7
<212> PRT
<213> Homo sapiens

<400> 45
Gly Ala Ser Ser Arg Ala Thr
 1   5

<210> 46
<211> 7
<212> PRT
<213> Homo sapiens

<400> 46
Trp Ala Ser Thr Arg Glu Ser
 1   5

<210> 47
<211> 7
<212> PRT
<213> Homo sapiens

<400> 47
Gly Ala Ser Ser Arg Ala Thr
 1   5

<210> 48
<211> 7
<212> PRT
<213> Homo sapiens

<400> 48
Gly Ala Ser Ser Arg Ala Thr
1 5

<210> 49
<211> 7
<212> PRT
<213> Homo sapiens

<400> 49
Gly Ala Ser Ser Arg Ala Thr
1 5

<210> 50
<211> 8
<212> PRT
<213> Homo sapiens

<400> 50
Gln Gln Tyr Tyr Asp Ser Tyr Thr
1 5

<210> 51
<211> 9
<212> PRT
<213> Homo sapiens

<400> 51
Gln Gln Leu Asn Ser Tyr Pro Leu Thr
1 5

<210> 52
<211> 9
<212> PRT
<213> Homo sapiens

<400> 52
Gln Gln Tyr Gly Ser Ser Pro Arg Thr
1 5

<210> 53
<211> 8
<212> PRT
<213> Homo sapiens

<400> 53
Gln Gln Tyr Tyr Asp Ser Tyr Thr
1 5

<210> 54
<211> 9
<212> PRT
<213> Homo sapiens

<400> 54
Gln Gln Tyr Asp Asn Val Pro Asp Thr
1 5

<210> 55
<211> 8
<212> PRT
<213> Homo sapiens

<400> 55
Gln Gln Tyr Gly Thr Ser Pro Leu
 1   5

<210> 56
<211> 9
<212> PRT
<213> Homo sapiens

<400> 56
Gln Gln Tyr Gly Ser Ser Pro Arg Thr
 1   5

<210> 57
<211> 23
<212> PRT
<213> Homo sapiens

<400> 57
Gly Gly Gly Val Val Gln Pro Gly Arg Ser Leu Lys Leu Ser Cys Ala
 1   5   10   15
Ala Ser Gly Phe Thr Phe Ser
            20

<210> 58
<211> 23
<212> PRT
<213> Homo sapiens

<400> 58
Gly Gly Gly Val Val Gln Ala Trp Arg Ser Leu Arg Leu Ser Cys Val
 1   5   10   15
Ala Ser Gly Phe Thr Phe Ser
            20

<210> 59
<211> 23
<212> PRT
<213> Homo sapiens

<400> 59
Gly Gly Gly Val Val Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala
 1   5   10   15
Ala Ser Gly Phe Thr Phe Ser
            20

<210> 60
<211> 23
<212> PRT
<213> Homo sapiens

<400> 60
Gly Ala Glu Val Arg Lys Pro Gly Thr Ser Val Arg Ile Ser Cys Arg

1 5 10 15
Ala Ser Gly Asn Thr Phe Thr
20

<210> 61
<211> 23
<212> PRT
<213> Homo sapiens

<400> 61
Gly Gly Gly Leu Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala
1 5 10 15
Thr Ser Gly Phe Ile Phe Asn
20

<210> 62
<211> 23
<212> PRT
<213> Homo sapiens

<400> 62
Gly Pro Gly Leu Val Arg Pro Ser Gln Thr Leu Ser Leu Thr Cys Pro
1 5 10 15
Val Ser Pro Gly Ser Ile Lys
20

<210> 63
<211> 23
<212> PRT
<213> Homo sapiens

<400> 63
Gly Ala Glu Val Lys Lys Pro Gly Ser Ser Val Lys Val Ser Cys Arg
1 5 10 15
Ala Ser Gly Gly Thr Phe Ser
20

<210> 64
<211> 14
<212> PRT
<213> Homo sapiens

<400> 64
Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val Ala
1 5 10

<210> 65
<211> 14
<212> PRT
<213> Homo sapiens

<400> 65
Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Met Gly
1 5 10

<210> 66
<211> 14
<212> PRT

<213> Homo sapiens

<400> 66
Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val Ser
1 5 10

<210> 67
<211> 14
<212> PRT
<213> Homo sapiens

<400> 67
Trp Val Arg Gln Pro Val Gly Lys Gly Leu Glu Trp Ile Gly
1 5 10

<210> 68
<211> 14
<212> PRT
<213> Homo sapiens

<400> 68
Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met Gly
1 5 10

<210> 69
<211> 32
<212> PRT
<213> Homo sapiens

<400> 69
Arg Phe Thr Ile Ser Lys Asp Asn Ser Lys Asn Thr Leu Tyr Leu Gln
1 5 10 15
Met Asn Ser Leu Arg Ile Asp Asp Thr Ala Val Tyr Tyr Cys Ala Ile
20 25 30

<210> 70
<211> 32
<212> PRT
<213> Homo sapiens

<400> 70
Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu Gln
1 5 10 15
Leu Ser Ser Leu Arg Pro Glu Asp Thr Ala Val Tyr Tyr Cys Thr Asn
20 25 30

<210> 71
<211> 32
<212> PRT
<213> Homo sapiens

<400> 71
Arg Phe Thr Ile Ser Lys Asp Asn Ser Lys Asn Thr Leu Tyr Leu Gln
1 5 10 15
Met Asn Ser Leu Arg Val Glu Asp Thr Ala Val Tyr Tyr Cys Ala Ile
20 25 30

<210> 72

<211> 32
<212> PRT
<213> Homo sapiens

<400> 72
Arg Val Ser Leu Thr Arg Asp Arg Ser Ser Asn Thr Val Phe Leu Glu
 1   5   10   15
Leu Ser Gly Leu Thr Glu Glu Asp Thr Ala Leu Tyr Phe Cys Ala Arg
            20   25   30

<210> 73
<211> 32
<212> PRT
<213> Homo sapiens

<400> 73
Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Ala Phe Leu Arg
 1   5   10   15
Met Asn Ser Gln Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala Lys
            20   25   30

<210> 74
<211> 32
<212> PRT
<213> Homo sapiens

<400> 74
Arg Val Ser Met Ser Val Asp Met Ser Arg Ser Gln Phe Phe Leu Glu
 1   5   10   15
Leu Arg Asp Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala Arg
            20   25   30

<210> 75
<211> 32
<212> PRT
<213> Homo sapiens

<400> 75
Arg Val Thr Ile Thr Ala Asp Asp Ser Thr Asn Thr Ala Tyr Met Gly
 1   5   10   15
Leu Ser Ser Leu Arg Ser Gly Asp Thr Ala Val Tyr Tyr Cys Ala Arg
            20   25   30

<210> 76
<211> 11
<212> PRT
<213> Homo sapiens

<400> 76
Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
 1   5   10

<210> 77
<211> 11
<212> PRT
<213> Homo sapiens

<400> 77

Trp Gly Gln Gly Thr Val Val Thr Val Ser Ser
1 5 10

<210> 78
<211> 11
<212> PRT
<213> Homo sapiens

<400> 78
Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
1 5 10

<210> 79
<211> 11
<212> PRT
<213> Homo sapiens

<400> 79
Trp Gly Gln Gly Ile Val Val Asn Val Phe Ser
1 5 10

<210> 80
<211> 11
<212> PRT
<213> Homo sapiens

<400> 80
Trp Gly Lys Gly Thr Thr Val Thr Val Ser Ser
1 5 10

<210> 81
<211> 16
<212> PRT
<213> Homo sapiens

<400> 81
Pro Asp Ser Leu Ala Val Ser Leu Gly Glu Arg Ala Thr Ile Asn Cys
1 5 10 15

<210> 82
<211> 16
<212> PRT
<213> Homo sapiens

<400> 82
Pro Ser Phe Leu Ser Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys
1 5 10 15

<210> 83
<211> 16
<212> PRT
<213> Homo sapiens

<400> 83
Pro Gly Thr Leu Ser Leu Ser Pro Gly Glu Arg Ala Thr Leu Ser Cys
1 5 10 15

<210> 84

<211> 16
<212> PRT
<213> Homo sapiens

<400> 84
Pro Asp Ser Leu Ala Val Ser Leu Gly Glu Arg Ala Thr Ile Asn Cys
 1   5   10   15

<210> 85
<211> 16
<212> PRT
<213> Homo sapiens

<400> 85
Pro Gly Thr Leu Ser Leu Ser Pro Gly Glu Gly Ala Thr Leu Ser Cys
 1   5   10   15

<210> 86
<211> 16
<212> PRT
<213> Homo sapiens

<400> 86
Pro Gly Thr Leu Ser Leu Ser Pro Gly Glu Gly Ala Thr Leu Ser Cys
 1   5   10   15

<210> 87
<211> 16
<212> PRT
<213> Homo sapiens

<400> 87
Pro Gly Thr Leu Ser Leu Ser Pro Gly Glu Arg Val Thr Leu Ser Cys
 1   5   10   15

<210> 88
<211> 15
<212> PRT
<213> Homo sapiens

<400> 88
Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro Lys Leu Leu Ile Tyr
 1   5   10   15

<210> 89
<211> 15
<212> PRT
<213> Homo sapiens

<400> 89
Trp Tyr Gln Leu Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr
 1   5   10   15

<210> 90
<211> 15
<212> PRT
<213> Homo sapiens

<400> 90
Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile Tyr
 1   5   10   15

<210> 91
<211> 15
<212> PRT
<213> Homo sapiens

<400> 91
Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro Lys Leu Leu Ile Tyr
 1   5   10   15

<210> 92
<211> 15
<212> PRT
<213> Homo sapiens

<400> 92
Trp Tyr Gln Gln Arg Pro Gly Gln Ala Pro Arg Leu Leu Ile Tyr
 1   5   10   15

<210> 93
<211> 15
<212> PRT
<213> Homo sapiens

<400> 93
Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile Tyr
 1   5   10   15

<210> 94
<211> 15
<212> PRT
<213> Homo sapiens

<400> 94
Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile Tyr
 1   5   10   15

<210> 95
<211> 32
<212> PRT
<213> Homo sapiens

<400> 95
Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
 1   5   10   15
Leu Thr Ile Ser Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
            20   25   30

<210> 96
<211> 32
<212> PRT
<213> Homo sapiens

<400> 96
Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Glu Phe Thr

1 5 10 15
Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Phe Ala Thr Tyr Tyr Cys
20 25 30

<210> 97
<211> 32
<212> PRT
<213> Homo sapiens

<400> 97
Gly Ile Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15
Leu Thr Ile Ser Arg Leu Glu Pro Glu Asp Phe Ala Val Tyr Tyr Cys
20 25 30

<210> 98
<211> 32
<212> PRT
<213> Homo sapiens

<400> 98
Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15
Leu Thr Ile Ser Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys
20 25 30

<210> 99
<211> 32
<212> PRT
<213> Homo sapiens

<400> 99
Gly Ile Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Ser
1 5 10 15
Phe Thr Ile Ser Ser Leu Gln Pro Glu Asp Thr Gly Thr Tyr Tyr Cys
20 25 30

<210> 100
<211> 32
<212> PRT
<213> Homo sapiens

<400> 100
Gly Ile Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15
Leu Thr Ile Ser Arg Leu Glu Pro Glu Asp Phe Ala Val Tyr Tyr Cys
20 25 30

<210> 101
<211> 32
<212> PRT
<213> Homo sapiens

<400> 101
Gly Ile Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15
Leu Thr Ile Ser Arg Leu Glu Pro Glu Asp Phe Ala Val Tyr Tyr Cys
20 25 30

<210> 102
<211> 14
<212> PRT
<213> Homo sapiens

<400> 102
Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Arg Thr Val Ala
 1   5   10

<210> 103
<211> 14
<212> PRT
<213> Homo sapiens

<400> 103
Phe Gly Gly Gly Ala Lys Val Gly Ile Arg Arg Thr Val Ala
 1   5   10

<210> 104
<211> 14
<212> PRT
<213> Homo sapiens

<400> 104
Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg Thr Val Ala
 1   5   10

<210> 105
<211> 14
<212> PRT
<213> Homo sapiens

<400> 105
Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Arg Thr Val Ala
 1   5   10

<210> 106
<211> 14
<212> PRT
<213> Homo sapiens

<400> 106
Phe Gly Gln Gly Thr Arg Leu Glu Ile Lys Arg Thr Val Ala
 1   5   10

<210> 107
<211> 14
<212> PRT
<213> Homo sapiens

<400> 107
Phe Gly Gln Gly Thr Arg Leu Glu Ile Lys Arg Thr Val Ala
 1   5   10

<210> 108
<211> 14
<212> PRT
<213> Homo sapiens

<400> 108
Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg Thr Val Ala
1 5 10

<210> 109
<211> 332
<212> DNA
<213> Homo sapiens

<400> 109
gaggcgtggt ccagcctggg aggtccctga aactctcctg tgcagcctct ggattcacat 60
tcagtagtca tggctcgcac tgggtccgcc aagctccagg caaggggctg gagtgggtgg 120
cacttttgtc gtctgatgga agtaataaat tctatataga atccgtgaag ggccgattca 180
ccatctccaa ggacaattct aagaacacac tgtatctgca aatgaacagc ctgagaattg 240
acgacacggc tgtctattac tgtgcgattt ccctggtggg aactaccgct tttaactact 300
ggggccaggg aaccctggtc accgtctcct ca 332

<210> 110
<211> 331
<212> DNA
<213> Homo sapiens

<400> 110
ggcgtggtcc aagcatggag gtccctaaga ctctcctgtg tagcctgtgg attcaccttc 60
agtagtcata ccatgcactg ggtccgccag gctccaggca aggggctgga gtgggtggca 120
cttatattct atgatggaag taataaatac tatgcagact ccgtgaaggg ccgattcacc 180
atctccagag acaattccaa gaacacgctg tatctgcaat tgagcagcct aagacctgag 240
gacacggctg tctattattg tacgaattcc gaggtgggag ctaccgcttt tgactactgg 300
ggccagggaa ccctggtcac cgtctcctca g 331

<210> 111
<211> 335
<212> DNA
<213> Homo sapiens

<400> 111
ggggaggcgt ggtccagcct gggaggtccc tgagactttt cctgtgcagc ctctggattc 60
accttcagtt cctatacttt ccactgggtc cgccaggctc caggcaaggg gctggagtgg 120
gtggcagtta tatcatatga tggaaacaag aaatactacg cagactccgt gaagggccga 180
ttcaccatct ccagagacaa ttccaagaac actctatatc tgcaaatgaa cagcctgaga 240
gttgaggaca cggctgttta ttactgtgcg atttccatag tgggaactac cgcttttaac 300
tactggggcc agggaaccct ggtcaccgtc tcctc 335

<210> 112
<211> 327
<212> DNA
<213> Homo sapiens

<400> 112
ccagactccc tggctgtgtc tctgggcgag agggccacca tcaactgcaa gtccagccag 60
agtgtttttt acacttccaa caataagaac tacttagctt ggtaccagca gaaaccaggc 120
cagcctccta agttgctcat ttactgggca tccacccggg aatccggggt ccctgaccga 180
ttcagtggca gcgggtctgg gacagatttc actctcacca tcagcagcct gcaggctgaa 240
gatgtggcag tttattactg tcagcaatat tatgattcgt acacttttgg ccaggggacc 300
aagctggaga tcaaacgaac tgtggct 327

<210> 113
<211> 312

<212> DNA
<213> Homo sapiens

<400> 113
ccatccttcc tgtctgcatc tgtaggagac agagtcacca tcacttgccg ggccagtcaa 60
ggcattagca gttatttagc ctggtatcag ctaaaaccgg ggaaagcccc taagctcctg 120
atctatgctg catccacttt gcaaagtggg gtcccatcaa ggttcagcgg cagtggatct 180
gggacagaat tcactctcac aataagcagc ctgcagcctg aagattttgc aacttattac 240
tgtcaacagc ttaatagtta ccctctcact ttcggcggag gggccaaggt ggggatcaga 300
cgaactgtgg ct 312

<210> 114
<211> 315
<212> DNA
<213> Homo sapiens

<400> 114
ccaggcaccc tgtctttgtc tccaggggaa agagccaccc tctcctgcag ggccagtcag 60
agtgttagca gcagctactt agcctggtac cagcagaaac ctggccaggc tcccaggctc 120
ctcatctatg gtgcatccag cagggccact ggcatcccag acaggttcag tggcagtggg 180
tctgggacag acttcactct caccatcagc agactggagc ctgaagattt tgcagtgtat 240
tactgtcagc agtatggtag ctcacctcgg acgttcggcc aagggaccaa ggtggaaatc 300
aaacgaactg tggct 315

<210> 115
<211> 327
<212> DNA
<213> Homo sapiens

<400> 115
ccagactccc tggctgtgtc tctgggcgag agggccacca tcaactgcaa gtccagccag 60
agtgtttttt acacttccaa caataagaac tacttagctt ggtaccagca gaaaccaggc 120
cagcctccta agttgctcat ttactgggca tccacccggg aatccggggt ccctgaccga 180
ttcagtggca gcgggtctgg gacagatttc actctcacca tcagcagcct gcaggctgaa 240
gatgtggcag tttattactg tcagcaatat tatgattcgt acacttttgg ccaggggacc 300
aagctggaga tcaaacgaac tgtggct 327

<210> 116
<211> 315
<212> DNA
<213> Homo sapiens

<400> 116
ccaggcaccc tgtcattgtc tccaggggaa ggagccaccc tctcctgcag ggccagtcag 60
agtgttagca gcagctacct agcctggtat cagcagagac ctggccaggc tcccaggctc 120
ctcatctatg gtgcatccag cagggccacc ggcatcccag acagattcag tggaagtgga 180
tctgggacag atttcagttt caccatcagc agtctgcagc ctgaagatac tgggacatat 240
tactgtcaac aatatgataa tgtccctgac acttttggcc aggggaccag gctggagatc 300
aaacgaactg tggct 315

<210> 117
<211> 312
<212> DNA
<213> Homo sapiens

<400> 117
ccaggcaccc tgtctttgtc tccaggggaa ggagccaccc tctcctgcag ggccagtcag 60
agtgttagca gcagctactt agcctggtac cagcagaaac ctggccaggc tcccaggctc 120

ctcatctatg gtgcatccag tagggccact ggcatcccag acaggttcag tggcagtggg 180
tctgggacag acttcactct caccatcagc agactggagc ctgaagattt tgcagtgtat 240
tactgtcagc agtatggtac ctcacccctc ttcggccaag ggacacgact ggagattaaa 300
cgaactgtgg ct 312

<210> 118
<211> 315
<212> DNA
<213> Homo sapiens

<400> 118
ccaggcaccc tgtctttgtc tccaggggaa agagtcactc tctcctgcag ggccagtcag 60
agtgttagca gcagttactt agcctggtac cagcagaaac ctggccaggc tcccaggctc 120
ctcatctatg gtgcatccag cagggccact ggcatcccag acaggttcag tggcagtggg 180
tctgggacag acttcactct caccatcagc agactggagc ctgaagactt tgcagtttat 240
tactgtcagc agtatggaag ctcacctcgg acgttcggcc aagggaccaa ggtggaaatc 300
aaacgaactg tggct 315

<210> 119
<211> 342
<212> DNA
<213> Homo sapiens

<400> 119
ggggctgagg gtgaggaagc ccggacctcc gtgaggatct cttgcagggc atctggaaac 60
accttcactg gccaccatat tcactgggtc cgccaggccc ctggacaagg ccttcagtgg 120
atgggaagaa tcaacccgac tggcggcggc gttagtctcg cacagagttt ccaggacaga 180
gtcagcctga ccagggacag gtcgtccaat acagtcttct tggaactgag cggcctcacg 240
gaggaggaca cggccttata tttctgtgcg aggccccgat ttaacatgat ccgggaacct 300
cttgacctct ggggccaggg gacagtggtc accgtctcct ca 342

<210> 120
<211> 348
<212> DNA
<213> Homo sapiens

<400> 120
gggggaggct tggtacagcc tgggggtcc ctgagactct cctgtgcaac ctctggattc 60
atctttaaca gctatgccat gaactgggtc cgccaggctc cagggaaggg gcttgagtgg 120
gtctcacgta ttagtggaaa tagtggaagc acattctacg cagactccgt gaagggccgg 180
ttcaccatct ccagagacaa ttccaagaac acggcgtttc tgcgaatgaa cagccagaga 240
gccgaagaca cggccgttta ttactgtgcg aaagatctgt cgagtggtgc atactactac 300
tacgggatgg acgtctgggg ccaagggacc acggtcaccg tctcctca 348

<210> 121
<211> 342
<212> DNA
<213> Homo sapiens

<400> 121
ggcccaggat tggtgaggcc atcacagacc ctatccctca cctgcactgt ctctccaggc 60
tccattaaag gtgatagtta cttctggagc tgggtccgtc agcccgtagg gaagggactg 120
gagtggatag ggcgtatcta cggcagaggg actaccaatt acaaccgtgt tttcgggagt 180
cgagtcagta tgtcagtgga catgtccagg agtcagtttt tcttggaatt gagagatgtg 240
accgccgcag acacggccgt ctattactgt gcgagagaca aggggtccga atactcctac 300
tttgacccct ggggccaggg aatagtggtc aacgtcttct ca 342

<210> 122

<211> 376
<212> DNA
<213> Homo sapiens

<400> 122
gggctgaggt gaagaagcct gggtcctcgg tgaaggtctc ctgcagggct tctggaggca 60
cattcagcag atatgctatc agctgggtgc gacaggcccc tggacaaggg cttgagtgga 120
tgggagggat catccctccc tttggtccag taaactacgc acagaagttc cagggcagag 180
tcacgattac cgcggacgat tccacgaaca cagcctacat gggtctgagc agcctgagat 240
ctggggacac ggccgtgtat tactgcgcga gagtggccta tgatggtagt ggctattaca 300
acaatatccc aaagatctac tactactcct acatggacgt ctggggcaaa gggaccacgg 360
tcaccgtgtc ctcagc 376

<210> 123
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> A flexible five amino acid tether.

<400> 123
Gly Gly Gly Gly Ser
1 5